

M.Sc.(FS) Semester - 1 (CBCS) Examination**Nov/Dec - 2022 [NEW COURSE]****Instrumental Techniques (CORE)****Time: 2:30 Hours****Marks: 70****Instructions:**

1. All questions are compulsory.
2. Figures to the right indicate marks.

Q1 (A) Answer all questions in short: (04)

1. Explain the principle of electrophoresis and the various types with forensic significance.

Q1 (B) Answer any two questions out of three: (10)

1. Make a note of the various types of rotors and their applications.
2. Explain sedimentation. additionally describe the factors that affect sedimentation rate.
3. Make a brief note about the factors that influence electrophoresis.

Q2 (A) Answer all questions in short: (04)

1. Give an example to illustrate the difference between adsorption and absorption chromatography.

Q2 (B) Answer any two questions out of three: (10)

1. Explain the principle and technique of size exclusion chromatography.
2. Describe any partition chromatography technology that has a forensic use.
3. Briefly describe the equipment and operation of gas liquid chromatography.

Q3 (A) Answer in short: (04)

1. Make a note of the UV-visible spectroscopy principle and types.

Q3 (B) Answer any two questions out of three: (10)

1. What is electromagnetic radiation? Explain briefly its properties.
2. Make a note of the principle and operation of AAS Spectroscopy.
3. Briefly describe the equipment and operation of IR Spectroscopy.

Q4 (A) Answer in short: (04)

1. List the different resolutions that the human eye, light microscope, SEM, and TEM have.
2. Explain the distinction between Magnification and Resolution

Q4 (B) Answer any two questions out of three: (10)

1. Make a comparison microscope note. Mention how it is used in forensics.
2. Briefly explain the principle and operation of a SEM microscope.
3. Mention the light microscope's basic principle. Distinguish between TEM and SEM.

Q5 (A) Answer in short: (04)

1. Describe your understanding of gas chromatography, including the many varieties and how it functions.

Q5 (B) Answer any two questions out of three: (10)

1. Make a note about how the ICP-MS works. Mention its forensic utility.
2. Briefly explain the principle and operation of HPLC.
3. Explain the distinction between FID and ECD detectors
